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The American Standards Association is organized to provide systematic means of cooperation in establishing American Standards to the end that duplication of work and the promulgation of conflicting standards may be avoided; to serve as a clearing house for information on standardization work in the United States and foreign countries; to act as the authoritative American channel in international cooperation in standardization work

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The Use of Safety Devices[1]

by
W. H. Cameron, *Managing Director*
National Safety Council

For more than twenty years the agitation for adequate mechanical safety devices has continued unabated. Hundreds of articles, speeches, reports, and books have been written to trace the revolution and evolution in the design, manufacture, application, and utilization of mechanical safeguards. Engineering science has been applied to the designing, building, installation, and adequacy of completely protected machines and equipment. The mere enumeration of the following words will trace in your memories the progress made in adapting fundamental machinery and equipment to conform to safety standards: boilers, steam generators, engines, gears, brakes, woodworking, mining, railroad, lighting, fire protection equipment, and hundreds of similar developments.

Concomitantly, personal protective equipment has been developed, such as goggles, safety shoes, clothing, gloves, respirators, first-aid and medical equipment, and hundreds of special articles that all tie in with specifications for complete safeguarding and protection of the worker in his entire environment on the plant property.

Therefore, there has been an effort to provide two kinds of physical protection: (1) the inclusion in new machines, or application of guards to old machines, and safe design and construction of buildings and equipment, and (2) the provision of equipment to be worn by employees, including masks, respirators, goggles, special clothing, and a score or more of similar items.

In the pioneer days the first safety men gave little emphasis to the need for a completely protected plant. They protected the few obvious danger points, such as protruding set screws. The management had been classifying most of the accidents as due to "carelessness" and there usually was an element of carelessness in every accident. Ten years of patient study of the causes of accidents revealed that 33 per cent to 50 per cent of the *severe* accidents were due to some physical condition, such as inadequate or incomplete safeguards; lack of complete control of the operation of machines through conveniently located levers, push buttons, and similar devices; absence of automatic oiling or automatic controls; absence of individual motor drives to replace hazardous transmission equipment; improper location or inadequacy of lighting machines; unsafe methods of material handling; incomplete protection at the point of operation. Fundamental safeguarding, including the elimination of every kind of physical hazard, and the development of varied accessories for the worker's protection, has been a long time in coming. There still must be continuous pressure from many directions to convince the stockholder, management, the various professions and trades having to do with the design, construction, and supervision of a modern operating plant that the first duty of management is to provide safe working conditions. It is not enough to rely upon supervision and education to keep the employees out of the points of danger. Man failure may cause many accidents but machine guarding will prevent many injuries.

There are abundant records in the experience of the State Workmen's Compensation Commission awards, the insurance company settlements, and individual employer records to prove that a third or more of the total cost of accidents is represented by mechanical causes.

Machine and equipment hazards vary with different industries. In the woodworking industry as much as 60 per cent of the entire cost may come from mechanical accidents. In the metals and metal-working industries, mechanical accidents run as high as 37 per cent for machine shops and 23 per cent for foundries. The records show that the accidents due to machinery generally cost considerably more than those due to personal causes because of increased severity. These figures I have given are measurements of accidents that are obviously mechanical in origin. We should remember, however, that mechanical safeguards will prevent many so-called non-mechanical accidents. A tool falling from a platform might easily be prevented if the platform were equipped with a toe board. The presence of a toe board does not relieve the employee of the responsibility for keeping tools in their proper place but it would help to prevent accidents ordinarily charged to "Carelessness".

Many studies have been made to show the direct influence of mechanical safeguarding on the indus-

[1] Address presented at the Fourth Annual Greater New York Safety Conference held in New York City on March 1 and 2, 1933.

trial injury rate but, unfortunately, it is difficult always to allocate credit specifically to the many elements in a safety program. If I may be allowed to go back a few years I would like to cite the experience of the State of Massachusetts in reported accidents from gears. State regulations requiring the guarding of gears became operative in March, 1918. There were 934 gear accidents for the year ending June 30, 1918, and the number of injuries from this source decreased to 359 for the year ending June 30, 1924. A net decrease of 52 per cent in this six-year period indicates the effectiveness of gear guards. Many of you are familiar with the oft-told experience of the Simmons Company, Kenosha, Wisconsin. By the intelligent method of equipping punch presses with gravity or chute feeds, one department, in which 700 presses were operating and which had previously lost 36 fingers in one year, went the four years following the installation of the new feeding devices without the loss of a single finger, and the production per press had increased on the average of 65 per cent. Mr. August Kaems, who was responsible for much of this fine work, says that in his experience whenever they made a job safe they also increased the production from 15 to 150 per cent. One corporation credits a reduction in eye accidents amounting to 75 per cent to the use of goggles. Another corporation reports spending in two years $7,000 for goggles for 1,400 employees, and in one year alone 54 pairs were completely smashed, 23 pairs were smeared entirely with molten metal, and 111 lenses were cracked by flying fragments. The saving in this one year was probably $50,000.

The experience of the past twenty years shows indubitably that complete safeguarding, as well as protective equipment for the worker, is the first and vital step in any accident-prevention program. In fact, a careful analysis of hundreds of thousands of accidents shows beyond doubt that the first responsibility of our Governments is to insist upon the observance of safety laws or codes. The builders and managers of plants must make the working conditions safe; there must be recognition of the value and use of safeguards as the first important fundamental issue in the safety program. The guards must be provided; their use made simple, comfortable, and natural. Safeguarding must be made as practical and natural as wearing shoes to protect our feet. When the complaint is made that the guard interferes with production, the guard must not be cast aside, but the process studied and the guard redesigned so that it will not interfere and will protect the worker. I will go so far as to say that if a serious hazard cannot be protected, and the probability of accident is high, it may be necessary to abandon the operation even if it brings loss to the company, instead of continuing it in the face of great danger to men. To abandon a good scheme is to admit defeat, but to be licked for want of ingenuity to design a guard is disaster.

A half-dozen speeches could be made on the relationship of safeguards and their utilization to the whole safety program. For example, nothing shakes the confidence of both employer and employee in the usefulness of safety equipment as much as when the products do not perform in accord with the claims made for them. Performance claims should not be made for equipment without absolute certainty. A percentage of accidents is sometimes attributed to a specific cause when there is no measuring stick on which this claim can be based. To illustrate: no manufacturer of a floor-cleaning material should claim that 10 per cent of the accidents in the plant can be reduced by using a floor cleanser, or that 90 per cent of all falls in a plant are due to slippery floors. It should be made clear to the purchasers of safety equipment that all accidents have many causes, and that the first duty of the employer is to make working conditions doubly safe through proper equipment and education, supervision, and insistence on safe practices, and safe rules followed through to eliminate all accidents.

There are still manufacturers of safety equipment who feel that standardization of devices threatens the opportunity for experimentation and, therefore, for improvement. Standardization should be dynamic and not static. Standardization should not be confused with attempts to establish arbitrary specifications. Specifications are of two kinds—those which are set up by engineers as the criteria of performance, and those which establish a minimum of requirement to satisfy regulation or law. Purchasers and designers of safety equipment should establish the first class, and ever struggle to make the performance better and better. The second class, which includes state regulations and standards codes cannot exceed in their specifications the upper limit of practicability for all users and makers. It might be said that the development specifications must come first to pave the way to adoption and the standardization specifications come after to stabilize and raise the general level of safety achievement. Standardization insures minimum safety requirements, and specifications for performance; and these should be desired by the manufacturer of safety equipment and by the employer. Minimum performance specifications are an absolute guidepost to the manufacturer of equipment. They do not stifle his originality of design, nor do they set up requirements as to kinds of material to be used.

The National Safety Council has taken a leading part in the development and promotion of safety codes, in cooperation with many others, and through the leadership of the American Standards Association. The voluntary adoption of safety code recommendations brings about the demand for and utilization of safety factors and protective equipment.

To sum up—new plants are built, as old ones are readapted to modern conditions. As the professions, trades, and management get farther with the study of the safety problem, there will be a deeper realization of the need for fundamental safety. Safety of working conditions will receive more respect from the employer the farther he goes with real accident prevention progress. The adequacy and substantiality of protective equipment will interest him. The complete protection of the worker will be as important to the job as production or any other element in the manufacturing process. The manager must prevent accidents to maintain the solvency of his plant, to get efficiency in his operations, to maintain decent relations with his employees, and to satisfy the demands of public opinion and governmental edict.

There must be higher and better standards in this equipment. This will come partly through more serious study and better understanding of complete protection. The product itself must never fail. The cost of equipment will be considered a good investment and the design can never be too good. The manufacturer of the device, the user, including both the employer and the employee, the development of the safety codes, their promulgation and sympathetic observance, are all problems in which the manufacturer and salesman should take part.

The National Safety Council will at all times stand side-by-side with the manufacturer of safety equipment in recommending its use, advertising its quality, and in more and more bringing home to industry the absolute first need of protective equipment in an adequate safety program.

American Standards Year Book

The establishment during the past 12 months of 30 new national industrial standards affecting the construction, electrical, mining, oil, steel, radio, and almost every other major American industry is recorded in the *American Standards Year Book* published by the American Standards Association. The *Year Book* is issued as a record of the cooperative achievement of nearly 3,000 scientists and engineers representing more than 500 national technical and trade organizations in the development of a unified system of basic technical standards for industry. The *Year Book* reveals that this work, which was started in 1918, has gone on without abatement during the past few years despite the depression.

Daniel C. Roper, United States Secretary of Commerce, in a foreword to the *Year Book* points out the importance of industrial standards in commerce. "National recognition of such standards," Mr. Roper says, "will remove misunderstandings and expedite commercial transactions. Especially is this important in interstate and international trade when the buyer is unable to inspect personally and select the commodities offered by the seller."

The new national standards listed in the *Year Book* are:

Safety Code for Floor and Wall Openings, Railings, and Toe Boards (A12-1932)
Steel Reinforcing Bars (A47-1932)
Forms for Concrete Joist Construction Floors (A48-1932)
Rotating Air Cylinders and Adapters (B5.5-1932)
Foundry Patterns of Wood (B45.1-1932)
Plain and Thread Plug and Ring Gage Blanks (B47-1932)
Inch-Millimeter Conversion for Industrial Use (B48.1-1933)
Shaft Couplings, Integrally Forged Flange Type for Hydro-Electric Units (B49-1932)
Specifications for Impregnated Paper Insulation for Lead-Coveted Power Cables (C8.10-1933)
Manufacturing Standards Applying to Broadcast Receivers (C16d-1932)
Specifications for Lake Copper Wire Bars, Cakes, Slabs, Billets, Ingots, and Ingot Bars (H17.1-1932)
Specifications for Electrolytic Copper Wire Bars, Cakes, Slabs, Billets, Ingots, and Ingot Bars (H17.2-1932)
Methods for Screen Testing of Ores (Hand Method) (M5-1932)
Safety Rules for Installing and Using Electrical Equipment in Metal Mines (M24-1932)
Abbreviations for Scientific and Engineering Terms (Z10i-1932)
Method of Test for Carbon Residue of Petroleum Products (Z11.25-1932)
Method of Testing Gas Oils (Z11.26-1932)
Method of Test for Expressible Oil and Moisture in Paraffin Waxes (Z11.27-1932)
Definitions of Terms Relating to Petroleum (Z11.28-1932)

Methods of Test for Dilution of Crankcase Oils (Z11.29-1932)
Methods of Test for Precipitation Number of Lubricating Oils (Z11.30-1932)
Engineering and Scientific Charts for Lantern Slides (Z15.1-1932)
Approval Requirements for Flexible Gas Tubing (Z21.2-1932)
Approval Requirements for Hotel and Restaurant Ranges (Z21.3-1932)
Approval Requirements for Private Garage Heaters (Z21.4-1932)
Approval Requirements for Clothes Dryers (Z21.5-1932)
Approval Requirements for Incinerators (Z21.6-1932)
Approval Requirements for Gas-Heated Ironers (Z21.7-1932)
Approval Requirements for Conversion Burners in House-Heating and Water-Heating Appliances (Z21.8-1933)
American Recommended Practice for Installation, Maintenance, and Use of Piping and Fittings for City Gas (Z27-1933)

Oil Industry Uses A.P.I. Standards

Probably no other industry has made such extensive use of standard specifications in its purchasing as the oil industry. A recent survey made by the Tulsa Purchasing Agents Association among its members on the use of standards adopted by the American Petroleum Institute shows a degree of adoption of these standards which is the best possible testimony as to their value. The percentage of all purchases to A.P.I. specifications for different types of equipment and supplies ranged from 78 to 100 per cent. More than 90 per cent of all boilers, derricks and standard rigs, tubular goods, rig irons, sucker rods, internal combustion engines and clutches, riveted tanks, and bolted tanks were purchased to A.P.I. specifications.

The use of these specifications has brought about not only very large savings through lowered costs and greater ease of replacement but also important advances in oil field practices. The Tulsa Purchasing Agents Association reported, for example, that advances in oil field drilling and production in recent years have to a considerable extent been due to the use of drilling and producing equipment and tools manufactured to A.P.I. specifications.

Bureau of Standards Issues 1933 Standards Yearbook

The National Bureau of Standards has issued the 1933 edition of the *Standards Yearbook*, an invaluable summary of information for those having an important interest in standardization activities in any field. As in previous editions, the book gives a comprehensive picture not only of governmental activities in connection with standards and specifications but also of the work of American and foreign national standardizing bodies and of the 300 technical and trade organizations in the United States which are engaged in standards-making activities in their special fields.

The *Standards Yearbook* may be obtained from the Superintendent of Documents, Washington, D.C., for $1.00 a copy.

Urges Standardization of Quality for Electrical Appliances

In the third of the series of lectures on industrial affairs, at the Imperial College of Science, Mr. Maurice Solomon discussed certain aspects of the electrical industry. He emphasized that further developments of the industry would involve a more widespread use of electrical appliances in the household. Such appliances must be properly standardized so as to be readily interchangeable. Moreover, there must be standardization of quality, for it is of the utmost importance that the user shall acquire and retain confidence in the safety and smooth working of electrical apparatus. As an indication of the extent to which electricity may be applied in the modern household, Mr. Solomon said that in his own house there are some 28 different types of electrical appliance in use.—*Reprinted from "Engineer," London.*

Price Changed for Standard on Bolts and Nuts

The price of the revised American Tentative Standard for Wrench-Head Bolts and Nuts and Wrench Openings (B18.2-1933), published by the American Society of Mechanical Engineers, has been changed from 45 cents to 50 cents per copy. The price of 45 cents was announced in the April issue of INDUSTRIAL STANDARDIZATION. Members of the American Standards Association are entitled to the usual 20 per cent discount.

Standardization in the Household[1]

It is rather surprising to see how patiently the housewives have contented themselves up to the present time with technically defective products in use in the household; particularly since their associations have shown remarkable initiative in other fields and are striving with great determination for the attainment of definite purposes. Why not, then, in a field which after all should be closer to the housewives' minds? Much irritation is experienced, and much money is spent for repairs on household equipment due to the technically defective design and workmanship of devices, apparatus, and machines.

If a cooking pan is in balance on the kitchen stove only when it is filled, and the weight of the handle will tip it over when it is empty, the design is technically wrong (*see Figure* 1).[2] A pitcher designed for appearance, but having the disadvantage that it cannot be thoroughly cleaned, either by hand or with any simple implement, should not be offered for sale. A household device may be very good in principle, but if, for example, unsuitable material has been chosen for certain component parts, or a screw thread is defective, or the assembly shows careless workmanship, the joy experienced in the household in the first use of such a machine will soon give way to scepticism and irritation.

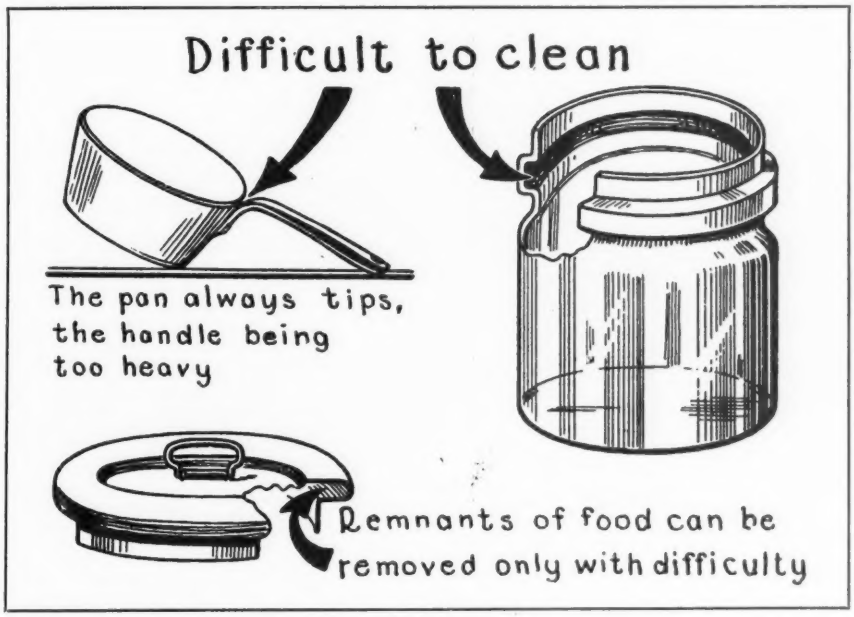

FIGURE 1

Examples of faulty design. The handle of the pan is too heavy, causing it to tip, and the jar and cover are difficult to clean.

It is obvious that in cases where the technical aspects of household equipment and machines have been neglected, little attention has been given to the standardization of such products. Only in the case of electric devices can a very cheering progress in this respect be noted.

When "standardization" is mentioned here, this term refers, of course, to a systematic plan of stand-

[1] Translation of an extensive abstract of an article by H. Zollinger, secretary of the Swiss national standardizing body (Bureau des Normes du VSM), published in the *STZ* (*Schweizerische Technische Zeitschrift*), the organ of the Swiss Technical Association. The translation was made by John Gaillard, mechanical engineer, American Standards Association.

[2] Figure reproduced through the courtesy of Deutscher Normenausschuss, the German national standardizing body.

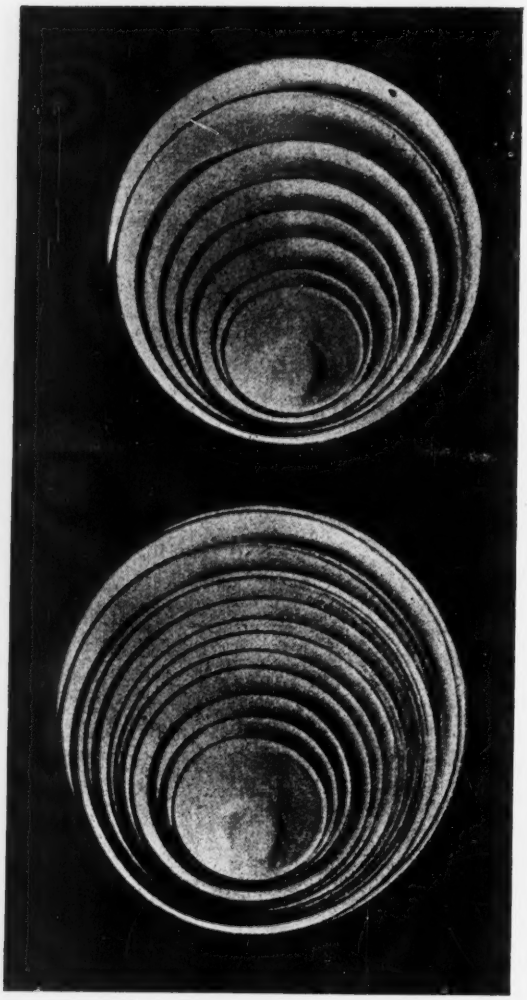

FIGURE 2

Below—sizes of the bowl stocked. Above—sizes needed to meet all requirements.

ardization work as carried out, for example, by the VSM (Society of Swiss Machine Industries) since 1918. Clumsy standardization work falls short of the goal in the same way as does technically incorrect design. Standardization also requires thinking along engineering lines. The work must have been well thought through, technically and economically, and the result must answer a real need; under these conditions standardization work is healthy. It seems to be necessary to point to these things again and again, for it is observed that frequently standardization work is taken up by people who are completely without the proper training and equipment for it.

All uncoordinated efforts in standardization work reduce its effectiveness. If all of the strings of standardization work do not come together in a central point, there is a failure to coordinate the standards economically. For this reason the Standards Bureau of the VSM has for many years promoted, on behalf of the Swiss Standards Association, the extension of the standardization idea in other fields. There are still large groups in Switzerland, however, that are not yet convinced of the absolute necessity of standardization work and remain aloof, if not opposed, to this movement. This applies in part also to standardization in the household. Obviously, we do not want to advocate that tableware, dishes, or individual objects of art or luxury should be standardized. There are, nevertheless, a large number of articles that could be successfully standardized for the household.

A certain amount of standardization has been done during the past few years by the manufacturers of cooking pans. These are no longer made, as before, in sizes stepping up by one centimeter, but

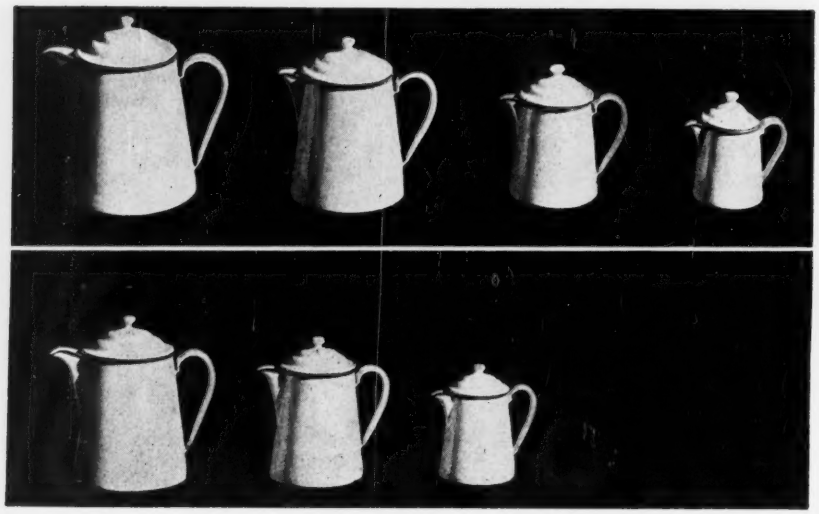

FIGURE 3

Above — pitcher sizes selected to meet all requirements. Below— additional sizes being stocked at present.

(Figures 2, 3, 4, and 5 are reproduced through the courtesy of the Bureau des Normes du VSM, the Swiss national standardizing body.)

by two centimeters; for example, by having diameters of 18, 20, 22, 24 cm, etc.

When investigating the products that must be kept in stock in a store of some considerable size, one comes to the conclusion that even reduction of the large number of sizes in itself would give an economic advantage. This would be standardization of the simplest kind. A few examples may be mentioned here.

The lower part of Figure 2 shows all of the sizes which had to be kept in stock of a kind of bowl commonly used in the household. The upper part of the figure shows a selection which would be entirely sufficient to cover all practical needs.

The upper part of Figure 3 represents the result of an effort to establish a selected series of milk pitchers sufficient to fill all practical needs. For the time being, however, the three additional sizes shown in the lower part of the figure must also be manufactured and kept in stock.

The three sizes of dust pans shown in the upper part of Figure 4 are decidedly sufficient for removing sweepings of the most various kinds of households; hence, the additional sizes shown in the lower part could be eliminated.

Simplifications of this kind could be made in many other cases. It is not always possible, however, simply to carry out a reduction of the existing types. Take, for example, preserving glasses—Figure 5. The housewife knows that in case she needs a replacement cover for any of the preserving glasses she is using she has to get one that is made by the manufacturer of these glasses, and she may not be able to get this in every store. How simple it would be if the housewife could be independent in this respect; that is, if all covers would fit all makes of glasses. The left-hand part of the figure shows how one cover may serve for a series of different glasses, and the right-hand part shows how a single cover can be used for two series. The ideal would be that a single cover would fit all types and sizes. In Switzerland we have not yet arrived at this point, but in Germany the national standardizing body has published standards in this field, and the glass manufacturers there began some time ago to adapt their products to these standards. The economic advantage of any kind of standardization would be largest for the manufacturers and the users if the period of transition could be made very short. Various causes usually prevent this. A more insistent demand on the part of consumers for standardized products, however, could be a decisive factor in expediting the introduction of standards.

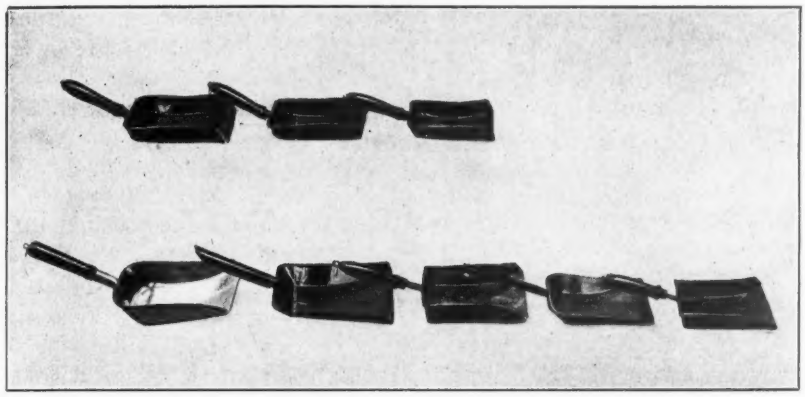

FIGURE 4

Above—the three sizes of dust pans considered sufficient for all household requirements. Below—additional sizes which could be eliminated.

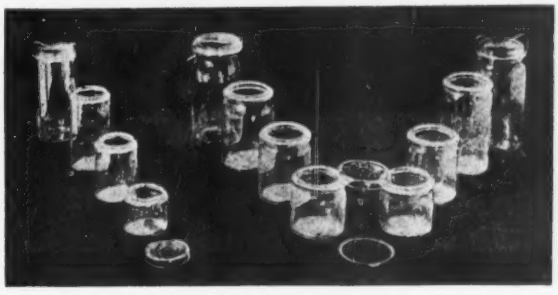

FIGURE 5

Left—a single standard cover fitting all of a series of jars. Right—a single standard cover fitting two different series of jars.

ASA PROJECTS

A Review of Chemical, Textile, Wood, and Miscellaneous Projects

The seventh of a series of reviews of standardization projects under the procedure of the American Standards Association

The status of all projects concerning the chemical, textile, and wood industries, and those listed in the miscellaneous project section, with the exception of the safety codes in these groups, is summarized in the following review. The report of the safety code projects was published in the issue of November, 1932. The data presented in this review are taken from the files of the American Standards Association and are corrected to April 1, 1933, bringing up to date the review of these projects published in the issue of May, 1932.

K3-1921[1]—Methods of Chemical Analysis of Manganese Bronze

Sponsor—American Society for Testing Materials.

K4-1921—Methods of Chemical Analysis of Gun Metal

Sponsor—American Society for Testing Materials.

The above standards, prepared by the sponsor, the American Society for Testing Materials, were submitted to ASA in 1921 and were approved as American Tentative Standards. The A.S.T.M. designations are B 27-19 and B 28-19.

K5-1922—Methods of Chemical Analysis of Alloys of Lead, Tin, Antimony and Copper

Sponsor—American Society for Testing Materials.

Scope—Methods applying particularly to white metal bearing alloys (known commercially as "Babbitt Metal") and to similar lead-base and tin-base alloys.

These laboratory methods, submitted to ASA by the A.S.T.M. as an existing standard, were approved as American Tentative Standard in 1922. The A.S.T.M. designation for this standard is B 18-21.

[1] Standard methods in the K Group (Chemical Industry) are widely used as a basis for analyses by producing, consuming, and independent agencies in the particular fields to which they refer.

Method of Test for Flash Point of Volatile Flammable Liquids

Sponsor—American Society for Testing Materials.

This standard method, formerly known as K8-1923, was advanced from American Tentative Standard to American Standard in 1932 and supervision was assumed by the Sectional Committee for Petroleum Products and Lubricants. This standard is now designated as Z11.24-1932.

K12-1921—Methods of Battery Assay of Copper

Sponsor—American Society for Testing Materials.

This standard method, adopted by the A.S.T.M. in 1920, and also approved by the American Chemical Society, was submitted to ASA and aproved as American Tentative Standard in 1921. The A.S.T.M. designation is B 34-20.

K14-1930—Specifications for Liquid Soap

Sponsor—U. S. Department of Commerce, Bureau of Standards.

Subsequent to the approval of U. S. Government Specifications for Liquid Soap (Circular of the Bureau of Standards No. 124 and Federal Specification No. 27) as American Tentative Standard in 1939, the document was published by the Federal Standard Stock Catalog Board as Federal Specification for Liquid Toilet Soap with the designation of P-S-618. In this publication, which is mandatory for use in all government specifications for liquid soap, minor changes in some of the chemical tests, as well as a few editorial changes, were made. In 1932, the ASA office carried out a canvass of prominent consuming and producing groups to determine the acceptability of the Federal Specification for Liquid Toilet Soap (P-S-618) as an American Standard. The revised document has not been submitted to the American Standards Association.

K15-1930—Methods of Routine Analysis of White Pigments

Sponsor—American Society for Testing Materials.

K16-1930—Methods of Routine Analysis of Dry Red Lead

Sponsor—American Society for Testing Materials.

Submitted by the American Society for Testing Materials under the proprietary method, these standards, covering the laboratory analyses of certain pigments, were approved as American Standards in 1929 and revised in 1930. The A.S.T.M. designations are D 34-30 and D 49-29.

K18-1930—Methods of Laboratory Sampling and Analysis of Coal and Coke

Sponsor—American Society for Testing Materials.

This standard, first approved in 1929, was revised in 1930. Although revisions are not now under consideration, A.S.T.M. Committee D-5 on Coal and Coke, which has supervision over it under proprietary procedure, has recently published as tentative an additional section covering optional methods for grinding coal samples. When adopted by the Society, the additional sections will be submitted for consideration by ASA for inclusion in the American Standard. The A.S.T.M. designation is D 271-30.

K19—Specifications for Fuel Oils

Sponsor—American Society for Testing Materials.

Recent progress in this field effected by the sectional committee functioning as Technical Committee C on Fuel Oils of A.S.T.M. Committee D-2, and also as the standing committee advisory to the Bureau of Standards has resulted in a revision of the Commercial Standard for Fuel Oils (CS12) which has been accepted by the industry and promulgated as CS12-33.

Further changes are now under consideration in the technical requirements for certain classes of fuel oil. If these are developed it is probable that three of the six proposed classes of fuel oil would be satisfactory for Diesel fuel, particularly if provisions covering volatility, sulfur content and Conradson carbon are added.

L3-1931—Specifications for Cotton Rubber-Lined Fire Hose for Public and Private Fire Department Use

Sponsors—American Society for Testing Materials; Fire Protection Group.

No changes have been proposed for this document, which was approved as American Standard in 1931. The A.S.T.M. designation is D 296-31 T.

L4—Specifications and Standards for Sheets and Sheeting

Autonomous Sectional Committee

On this project, which resulted from a request by the American Home Economics Association for the preparation of specifications and standards for sheets and sheeting, a draft giving technical details for different weights of sheeting was prepared in 1929. As certain members of the Cotton Textile Institute were not in a position to accept the recommendations of the draft, however, the project has been held in abeyance.

During the past year one of the largest manufacturers of sheetings requested assistance from the Division of Trade Standards, Bureau of Standards, Department of Commerce, in developing standard specifications for percale sheetings and pillow casings. It is understood that this project is under way.

L5-1931—General Methods of Testing Woven Textile Fabrics

Sponsor—American Society for Testing Materials.

This general standard, covering methods of testing woven textile fabrics, was approved as American Standard in 1931. The A.S.T.M. designation is D 39-27. Sections covering additional tests are now under consideration by A.S.T.M. Committee C-13. These proposed additions, presenting methods for determining the tear resistance of fabrics, have been published as tentative by the Society.

L6—Specifications for Blankets

Work on the preparation of specifications for blankets was started by ASA in 1929 at the request of the American Home Economics Association, but has been in abeyance for some time. In 1932, the Division of Trade Standards, Bureau of Standards, Department of Commerce, in cooperation with certain manufacturing and consuming groups, developed the Commercial Standard for Wool and Part-Wool Blankets (CS 39-32). The effective date of this standard, originally announced as December 31, 1932, was postponed to March 31, 1933, to permit clearance of stocks in the hands of distributors and retailers. Until data regarding the application of the commercial standard becomes available, it is not likely that further work on the ASA project will be undertaken.

O3-1926—Specifications for Cross-Ties and Switch-Ties

Sponsors—American Railway Engineering Association; U. S. Department of Agriculture, Forest Service.

As a result of several years of work under the direction of the American Railway Engineering Association and the Forest Service of the U. S. Department of Agriculture, specifications for cross-ties and switch-ties were developed and approved as American Standard in 1926. Since their approval these specifications have been adopted as standard by the American Railway Association, the National Hardwood Association, and the National Lumbermen's Association. Consideration has been given to the possible necessity of rewriting certain sections of this standard to clarify their provisions but this work has not been undertaken as yet.

O4—Methods of Testing Wood

Sponsors—American Society for Testing Materials; U. S. Department of Agriculture, Forest Service.

In 1927, Methods of Testing Small Clear Specimens of Timber and Methods of Conducting Static Tests of Timbers in Structural Sizes were adopted by the A.S.T.M. with the designations of D 143-27 and D 198-27, respectively. They were approved in the same year as American Standard with the ASA designations O4a-1927 and O4b-1927, respectively. No revisions are under consideration.

O5—Specifications for Wood Poles

Sponsor—ASA Telephone Group.

The specifications and uniform dimension tables for northern white cedar poles, western red cedar poles, chestnut poles, and southern pine poles, which were prepared by the sectional committee and approved by ASA in 1931, continue in wide use, as shown by the fact that since their publication in 1931 over 30,000 copies of the specifications have been sold by the ASA office. The sectional committee is now at work on specifications and dimension tables for lodgepole pine and Douglas fir poles for submittal to ASA for approval. This work has now reached an advanced stage and it is expected that these new specifications and dimensions will be submitted to ASA for approval within the next few months.

X1-1921—Method for Sampling of Coal

Sponsor—American Society for Testing Materials.

The method indicated in this standard (the A.S.T.M. designation is D 21-16) applies principally to the testing of large samples of coal—carload or shipload quantities—and should not be confused with the methods used for the laboratory sampling and analysis of coal, which are covered by the American Standard K18-1930. In the preparation of this standard method the Bureau of Mines took an active part and has brought the method into general use in its own work and recommended it for use wherever coal deliveries are sampled. The Bureau has found that the specifications meet the needs of the industry.

In 1932 the American Society for Testing Materials published, as tentative, recommendations covering the sampling of coke which had been developed by A.S.T.M. Committee D-5. There is a possibility that this tentative method for sampling coke may at some later time be incorporated with X1-1921, since many of the sections are quite similar.

Z7-1932—Illuminating Engineering Nomenclature and Photometric Standards

Sponsor—Illuminating Engineering Society.

This standard was originally submitted by the Illuminating Engineering Society to ASA and was approved in 1925 as an American Standard, the Society being appointed sole sponsor. In 1928 the sponsor announced its intention to revise the standard, requesting that the standard when revised be considered as its proprietary standard. This request was granted by ASA. The proposed standard in revised form was published for criticism and comment in the *Transactions of the Illuminating Engineering Society* of October 8, 1930. After final consideration this revision was submitted to ASA, and was approved as American Standard in December, 1932. The revisions consist chiefly of improvements in wording rather than fundamental changes in substance.

Z10—Scientific and Engineering Symbols and Abbreviations

Sponsors—American Association for the Advancement of Science; American Institute of Electrical Engineers; American Society of Civil Engineers; American Society of Mechanical Engineers; Society for the Promotion of Engineering Education.

The great confusion existing in the text-books and technical journals of the various industries and professions, because of the wide variation in the symbols and abbreviations used, has long been a source of misunderstanding and continued discussion among scientific and engineering groups throughout the English-speaking world. The unification of these

symbols and abbreviations is particularly desired by research workers, designing engineers, and many others in order that the formulas which are widely used may be readily understood and applied more quickly and with fewer errors. A formal request for the unification of such practices was made to the American Standards Association in 1922 by the American Institute of Electrical Engineers and the Association of Edison Illuminating Companies. Five leading technical societies accepted joint sponsorship for the sectional committee which they organized in January, 1926.

Development of these projects has proceeded slowly because of the magnitude of the work, but the following reports have been adopted as American Standard or American Tentative Standard:

Symbols for Mechanics, Structural Engineering, and Testing Materials (Z10a-1932)
Symbols for Hydraulics (Z10b-1929)
Symbols for Heat and Thermodynamics (Z10c-1931)
Symbols for Photometry and Illumination (Z10d-1930)
Aeronautical Symbols (Z10e-1930)
Mathematical Symbols (Z10f-1928)
Letter Symbols for Electrical Quantities (Z10g1-1929)
Graphical Symbols for Telephone and Telegraph Use (Z10g6-1929)
Navigational and Topographical Symbols (Z10h-1930)
Abbreviations for Scientific and Engineering Terms (Z10i-1932)

Three other standards; namely, Graphical Symbols for Electric Power and Wiring (Z10g2), Graphical Symbols for Radio (Z10g3), and Graphical Symbols for Electric Traction Including Railway Signalling (Z10g5), have been submitted for approval by the sponsors and referred to the Electrical Standards Committee for its recommendation to the Standards Council. This recommendation has been withheld, however, since an internal committee of the ESC is of the opinion that a further effort should be made to reconcile the cases where different symbols for the same device are shown in the three standards. It is expected that this may be accomplished in the near future.

Z11—Methods of Testing Petroleum Products and Lubricants

Sponsor—American Society for Testing Materials.

During the past year as a result of recommendations from the sectional committee, which were endorsed by the A.S.T.M., several changes were made in the status of petroleum standards. Two new American Standards and four new American Tentative Standards were approved; one existing American Standard was revised; and four American Tentative Standards were advanced to the status of American Standard.

A complete list of American Standards under supervision of the sectional committee is as follows (those marked 1932 indicate standards upon which action was taken during the year).

Z11.1-1928—Standard Abridged Volume Correction Table for Petroleum Oils (A.S.T.M. D 206-25) (A.P.I. 500-29)
Z11.2-1930—Methods of Test for Viscosity of Petroleum Products and Lubricants (A.S.T.M. D 88-30) (A.P.I. 518-30)
Z11.3-1928—Method of Test for Penetration of Greases and Petrolatum (A.S.T.M. D 217-27T)
Z11.4-1928—Method of Test for Melting Point of Paraffin Wax (A.S.T.M. D 87-22) (A.P.I. 513-29)
Z11.5-1932—Method of Test for Cloud and Pour Points of Petroleum Products (A.S.T.M. D 97-30) (A.P.I. 506-30)
Z11.6-1928—Method of Test for Flash and Fire Points by Means of Open Cup (A.S.T.M. D 92-24) (A.P.I. 511-29)
Z11.7-1928—Method of Test for Flash Point by Means of the Pensky-Martens Closed Tester (A.S.T.M. D 93-22) (A.P.I. 510-29)
Z11.8-1930—Method of Test for Water and Sediment in Petroleum Products, by Means of Centrifuge (A.S.T.M. D 96-30) (A.P.I. 520-30)
Z11.9-1930—Method of Test for Water in Petroleum Products and Other Bituminous Materials (A.S.T.M. D 95-30) (A.P.I. 519-30)
Z11.10-1930—Method of Test for Distillation of Gasoline, Naphtha, Kerosene, and Similar Petroleum Products (A.S.T.M. D 86-30) (A.P.I. 507-30)
Z11.11-1932—Method of Test for Distillation of Natural Gasoline (A.S.T.M. D 216-30) (A.P.I. 508-30)
Z11.12-1928—Method of Test for Neutralization Number of Petroleum Products and Lubricants (A.S.T.M. D 188-27 T)
Z11.13-1928—Method of Test for Sulfur in Petroleum Oils Heavier than Illuminating Oil (A.S.T.M. D 129-27) (A.P.I. 516-29)
Z11.14-1928—Method of Test for Thermal Value of Fuel Oil (A.S.T.M. D 240-27) (A.P.I. 517-29)
Z11.15-1928—Method of Test for Steam Emul-

sion of Lubricating Oils (A.S.T.M. D 157-28) (A.P.I. 515-29)
Z11.16-1928—Method of Analysis of Grease (A.S.T.M. D 128-27) (A.P.I. 501-29)
Z11.17-1930—Method of Test for Burning Quality of Kerosene Oils (A.S.T.M. D 187-30) (A.P.I. 502-30)
Z11.18-1930—Method of Test for Burning Quality of Mineral Seal Oil (A.S.T.M. D 239-30) (A.P.I. 504-30)
Z11.19-1930—Method of Test for Burning Quality of Long-Time Burning Oil for Railway Use (A.S.T.M. D 219-30) (A.P.I. 503-30)
Z11.20-1930—Method of Test for Saponification Number (A.S.T.M. D 94-28) (A.P.I. 514-29)
Z11.21-1930—Method of Test for Detection of Free Sulfur and Corrosive Sulfur Compounds in Gasoline (A.S.T.M. D 130-30) (A.P.I. 521-30)
Z11.22-1932—Method of Test for Melting Point of Petrolatum (A.S.T.M. D 127-30) (A.P.I. 523-30)
Z11.23-1932—Method of Test for the Determination of Autogenous Ignition Temperatures (A.S.T.M. D 286-30) (A.P.I. 522-30)
Z11.24-1932—Method of Test for Flash Point of Volatile Flammable Liquids (A.S.T.M. D 56-21) (A.P.I. 509-29) *(Formerly ASA K8-1923)*
Z11.25-1932—Method of Test for Carbon Residue of Petroleum Products (A.S.T.M. D 189-30) (A.P.I. 505-30)
Z11.26-1932—Methods of Testing Gas Oils (A.S.T.M. D 158-28) (A.P.I. 512-29)
Z11.27-1932—Method of Test for Expressible Oil and Moisture in Paraffin Waxes (A.S.T.M. D 308-29 T)
Z11.28-1932—Definitions of Terms Relating to Petroleum (A.S.T.M. D 288-31 T)
Z11.29-1932—Method of Test for Dilution of Crankcase Oils (A.S.T.M. D 322-30 T)
Z11.30-1932—Method of Test for Precipitation Number of Lubricating Oils (A.S.T.M. D 91-30 T)

During the past year some progress has been made in the organization of an international committee (ISA Committee 28) to consider the possibility of unifying national standards for Nomenclature and Methods of Test of Petroleum Products. The American Standards Association, which is serving as secretariat for this committee, has been advised that the standardizing bodies of the following countries have agreed to participate: Austria, Czechoslovakia, Denmark, France, Germany, Holland, Italy, Japan, Roumania, and the United States. It is expected that others will join soon.

A meeting of this committee will be held in connection with the World Petroleum Congress on July 25, 1933, in South Kensington, England. Dr. R. P. Anderson, who is the American representative on this committee, will represent interested American industrial groups at this meeting. Dr. Anderson is secretary of Sectional Committee Z11, and of A.S.T.M. Committee D-2, which is identical with the sectional committee. He is also secretary of the Division of Refining of the American Petroleum Institute.

Z14—Standards for Drawings and Drafting Room Practice

Sponsors—American Society of Mechanical Engineers; Society for the Promotion of Engineering Education.

In July, 1932, subcommittee 6 on Graphical Symbols and Drawings distributed for general criticism and comment a draft standard concerning symbols for plumbing fixtures, conventional rivet layouts, heat power apparatus, electric power apparatus, pipe and pipe fittings, and heating and ventilating layouts.

All of the proposed standards so far published, dealing with methods of indicating dimensions; lettering; layout of drawings; line work; and graphical symbols, have been for some time in the hands of an editing committee for final drafting. This committee consists of the chairmen of the six subcommittees, which include those on the subjects listed above as well as the subcommittee on paper and cloth specifications.

Z15—Standards for Graphics

Sponsor—American Society of Mechanical Engineers.

The standard for Engineering and Scientific Charts for Lantern Slides was approved by ASA during the past year as American Recommended Practice Z15.1-1932. It was developed by subcommittee 4 on Engineering and Scientific Graphs, which has also made good progress with the balance of its work.

Subcommittee 3 on Preferred Practice in Graphic Presentation has made considerable progress and is expected to submit a proposal at an early date.

Z17—Preferred Numbers

The organization of this new sectional committee has been completed. It is expected that during the course of this year it will take up the review of the

informal recommendation published by ASA in 1927, as well as such other problems as may come up.

Z18—Standardization of Speeds of Machinery

Sponsor—American Society of Mechanical Engineers.

A proposed standard for machine speeds, dated March, 1933, was published for general criticism and comment early in April.

Z21—Approval and Installation Requirements for Gas-Burning Appliances

Sponsor—American Gas Association.

Of the 21 approval and installation requirements for gas-burning appliances under development by a sectional committee under the sponsorship of the American Gas Association, seven have recently been approved as American Standard. These cover flexible gas tubing, hotel and restaurant ranges, private garage heaters, clothes dryers, incinerators, gas-heated ironers, and conversion burners in house-heating and water-heating appliances.

Work on approval requirements for additional appliances, covering a wide range of service, is proceeding satisfactorily and several further documents are nearing completion.

The approval requirements for gas ranges formally approved more than a year ago are now undergoing revision.

Cooperation between this sectional committee and the Committee on Gases of the National Fire Protection Association brought about proper coordination of the requirements for the installation of conversion burners and the specifications for the installation, maintenance, and use of piping and fittings for city gas (Z27) prior to their approval by the American Standards Association.

Z22—Dimensional Standards and Recommended Practice for Motion Picture Apparatus

Sponsor—Society of Motion Picture Engineers.

During the past year the proprietary sponsor for this project notified the American Standards Association that it was proceeding with a revision of these standards for submission for approval.

Z23—Specifications for Sieves for Testing Purposes

Sponsors—American Society for Testing Materials; U. S. Department of Commerce, Bureau of Standards.

The sectional committee for this project, which was authorized in 1931, followed a year's active preparation of a draft for a proposed American Standard by further consideration of this draft at a meeting held in New York on March 8, 1933. Discussion at this meeting brought out the necessity for incorporating a few minor changes in the draft of the standard. It is now expected that action recommending its approval will be taken soon.

Z24—Acoustical Measurements and Terminology

Sponsor—Acoustical Society of America.

This sectional committee has been very active during the past year through the medium of its four subcommittees on Terminology, Noise Measurement, Fundamental Sound Measurement, and Sound Insulation and Sound Absorption Measurement. The work of the first two of these subcommittees has progressed to a point where it is expected that their reports will be considered by a meeting of the whole sectional committee, to be held during June, after which they will be published and widely circulated for the purpose of securing comments and suggestions.

Z25—Rules for Rounding Numerical Values

A recommendation for the establishment of standard rules for rounding numerical values, applicable to engineering work in general, was made by the general conference called in connection with the project on Inch-Millimeter Conversion for Industrial Use (B48) (*see* INDUSTRIAL STANDARDIZATION, *February, 1933, page 46*).

Z27-1933—American Recommended Practice for the Installation, Maintenance, and Use of Piping and Fittings for City Gas

Sponsor—National Fire Protection Association.

Provisions for the installation, maintenance, and use of piping and fittings for city gas—natural, manufactured, or mixed—representing several years' work of a committee of the National Fire Protection Association, were submitted under the existing standard method and approved as American Recommended Practice early in the year, at which time the N.F.P.A. was designated as sponsor, future revision to be by the sectional committee method.

Careful correlation of this document with the requirements for gas-burning appliances (Z21), in

course of development under the sponsorship of the American Gas Association, has coordinated the work of the two organizations.

(Announcement of approval of the document, with detailed outline of its provisions, was published in the April issue of INDUSTRIAL STANDARDIZATION.)

Electrical Standards Committee Ballots on Projects

Electrical Insulating Materials in General (C59)—The Electrical Standards Committee is taking a letter ballot on the questions involved in the initiation of a project on the subject of electrical insulating materials in general. The ballot, which is being taken on the recommendation of the Committee on Scope of the ESC, proposes that the American Society for Testing Materials be designated as sponsor for the project, which would have the following formal scope:

> "Specifications and methods of test for electrical insulating materials (*Note:* In view of the wide field covered by this scope, it is understood that detailed scopes will be assigned to individual projects thereunder and that these will be submitted to the ESC for review)."

Specifications for Code Rubber Insulation (C8.11)—The Electrical Standards Committee is also taking a letter ballot on the question of recommendations to the Standards Council on the approval as American Standard of specifications for code rubber insulation. These proposed specifications were prepared by the Sectional Committee on Insulated Wires and Cables (C8) which is under the sponsorship of the Electrical Standards Committee. The specifications cover the grade of insulation known to the trade as code rubber insulation. These are not specifications for the complete insulated wire but only for the insulation, it being the program of the sectional committee to prepare the specifications for braids, insulation, the copper wire, etc. as separate specifications.

Constant Current Transformers (C57.1)—A ballot is also being taken by the Electrical Standards Committee on the question of recommendations to the Standards Council on the approval of standards for constant current transformers as American Standard. These standards were submitted by the American Institute of Electrical Engineers and constitute a revision of the existing A.I.E.E. Standard No. 12, edition of May, 1930.

Future revisions of these standards will be handled by the Sectional Committee on Transformers (C57), the organization of which is now practically complete. This committee will also take care of standards for a large variety of other types of transformers.

The proposed standards for constant current transformers cover the type of transformer which is used for supplying series street lighting circuits.

Code for Protection Against Lightning (C5)—Another letter ballot is being taken by the Committee on the question of recommendations to the Standards Council on the approval as American Standard of a revision of Parts 1 and 2 of the Code for Protection Against Lightning. Part 1 of the Code covers the protection of persons against lightning, while Part 2 covers the protection of buildings and miscellaneous property. Part 3 of the Code, which covers the protection of structures containing inflammable liquids and gases and is approved as American Tentative Standard, is not changed by this proposed revision.

Revision of Standard for Testing Portland Cement

The American Standards Association recently approved the A.S.T.M. Standard Methods of Sampling and Testing Portland Cement (C77-32) as a revision of the American Standard Methods of Testing Cement (A1b-1931). The title of the revised American Standard has been changed to Methods of Sampling and Testing Portland Cement and the new ASA designation is A1.2-1933. The revision just approved was acted upon by the sectional committee following its consideration by A.S.T.M. Committee C-1 through a two-year period preceding its adoption by the American Society for Testing Materials in June, 1932.

As has been the customary practice of the A.S.T.M. and ASA, orders for Specifications for Portland Cement (A1a-1930) will be filled by including with the specifications copies of the Standard Methods of Sampling and Testing Portland Cement (A1.2-1933), since these two standards are closely related.

Copies of the new standard may be purchased from the American Society for Testing Materials, 1315 Spruce Street, Philadelphia, or from the American Standards Association, at 25 cents each. Members of ASA are entitled to the usual 20 per cent discount on copies purchased through the office of the American Standards Association.